

Serial No. 10/791,453

-4-

52503sh

REMARKS

Following a restriction requirement, Applicant canceled all claims except 32-34, 38-40 and 55 and 56. In an Office Action mailed September 27, 2004, the Examiner rejected these pending claims over one or more of the following patents: U.S. Patent No. 3,943,407 to Bolasny; U.S. Patent No. 4,124,003 to Abe et al.; and U.S. Patent No. 5,977,716 to Motouchi. By the present amendment, Applicant has canceled claims 32-34 and amended claims 38, 39 and 55 to correct typographical errors. Claims 38-40, 55 and 56 remain pending.

Claims 38-40

Independent claim 38 stands rejected under §102(b) as anticipated by either the Bolasny patent or the Motouchi patent.

Anticipation may be established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention. RCA Corp. v. Applied Digital Data Systems, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984). Moreover, anticipation requires the presence of all elements of a claimed invention as arranged in the claim, such that a disclosure "that 'almost' meets that standard does not 'anticipate'." Connell v. Sears, Roebuck Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983).

Applicant respectfully submits that the Bolasny and Motouchi patents do not show all elements of independent claim 38. Independent claim 38 is a method claim wherein one step is "providing a homogenous charge compression ignition engine of the type operable to compress a combustible mixture of fuel and air until the mixture autoignites without the introduction of a spark". (Emphasis added). Applicant has carefully reviewed the Bolasny and Motouchi patents and neither appear to disclose a homogenous charge compression ignition engine that compresses a combustible mixture of fuel and air until the mixture autoignites without the introduction of a spark. Instead, each patent merely mentions the use of an ion generator with a traditional spark ignited internal combustion engine. For example, the Bolasny disclosure describes the operation of a traditional spark ignited engine (see column 13, lines 5-36). The Motouchi specification mentions an "internal combustion engine" (column 5, lines 39-40) and explains that the invention may be "applicable to other combustion apparatuses", including "boilers, heat treat furnaces, incinerators

Serial No. 10/791,453

-5-

52503sh

and the like." (Column 6, lines 52-56). A homogenous charge compression engine, as required by claim 38, differs from a spark ignited engine in that the combustible mixture is compressed until it autoignites. A spark is not provided in order to ignite the combustible mixture. There is no suggestion in Motouchi or Bolasny to use an ion generator in such engine.

Claim 38 further requires "adjusting the energizing of the corona discharge device so as to control combustion phasing in the engine." (Emphasis added) As discussed in Applicant's specification, a challenge faced in a homogenous charge compression ignition engine is the control of when the autoignition occurs relative to piston top dead center. Claim 38 provides for adjusting a corona discharge device so as to control this combustion phasing. Use of such a corona discharge device appears not to be recognized by the cited prior art. Neither Motouchi nor Bolasny make any mention of the effect of ionized gas on combustion phasing. Instead, they cite "increased combustion efficiency" and "reduction of the air pollution" (Motouchi column 2, lines 54-57) and that it "increases engine efficiency" and "reduces pollution" (Bolasny column 2, lines 10-12). Further, neither reference appears to suggest adjusting a corona discharge device for any purpose, let alone for the control of combustion phasing.

In light of the above, Applicant respectfully submits that claim 38 is in condition for allowance. Claims 39 and 40 depend from claim 38, and are allowable therewith.

Claims 55 and 56

Independent claim 55 is an apparatus claim. It stands rejected under §102(b) as anticipated by the Bolasny patent. Applicant submits that the Bolasny reference does not provide each and every element required by claim 55. Claim 55 requires a first and a second corona discharge device, with each introducing ions and free radicals into different cylinders. It does not appear that Bolasny mentions more than one ion generator. Additionally, claim 55 requires "a controller operable to control the first and second corona discharge devices so as to selectively adjust the relative combustion phasing of the first and second cylinders." (Emphasis added) As discussed above, with respect to claim 38, Applicant submits that the Bolasny reference makes no mention of using an ion generator to control combustion phasing. Further, it does not make any mention or suggestion of using two corona discharge devices to adjust the relative combustion phasing of two cylinders.

Serial No. 10/791,453

-6-

52503sh

In light of the above, Applicant respectfully submits that claim 55 is in condition for allowance. Claim 56 depends from claim 55 and is therefore allowable therewith.

Questions regarding this Application may be directed to the undersigned attorney at the telephone/facsimile numbers provided.

Respectfully submitted,

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